

## Executive Summary

In 2006, Lake County and participating Lake County municipalities developed and adopted the first *Lake County Countywide All Natural Hazards Mitigation Plan (ANHMP)*. The Federal Emergency Management Agency (FEMA), through the Disaster Mitigation Act of 2000 (DMA 2000) and the Stafford Act require that a community develop and adopt a FEMA-approved natural hazard mitigation ANHMP in order to be eligible for hazard mitigation grant funds. DMA 2000 and the Stafford Act require that the mitigation ANHMP be updated and re-adopted every five years to maintain grant eligibility. This 2017 ANHMP is the second update of the 2006 ANHMP. The ANHMP is multi-jurisdictional, meaning the County and the municipalities must adopt the ANHMP.



This ANHMP meets all FEMA planning requirements including those of the FEMA National Flood Insurance Program's (NFIP) Community Rating System (CRS). The ANHMP allows Lake County and the participating communities to receive Hazard Mitigation Assistance Program (HMA) grant funding from FEMA to fund mitigation projects. More can be learned about these programs at: <http://www.fema.gov/hazard-mitigation-grant-program>. CRS allows participating communities to earn credit towards discounts in flood insurance premiums.

"Hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event."

FEMA

While this ANHMP meets federal planning requirements, it has also been prepared to protect life, health and safety, and to reduce damage to property and infrastructure from natural hazards. This ANHMP assesses the natural hazards that affect Lake County, sets mitigation goals, considers mitigation efforts currently being implemented, evaluates additional mitigation strategies, and recommends mitigation actions to be implemented over the next five years. The mitigation actions are designed to protect the people and assets of Lake County, and designed to be undertaken by both the public and the private sectors.

## ANHMP Development

The ANHMP update was conducted with the input of the Lake County Hazard Mitigation Planning Committee (HMPC), which includes Lake County departments and agencies, Lake County municipalities and other stakeholders. The HMPC has been in place since the development of the 2006 ANHMP and has been meeting annually. The efforts of the HMPC were coordinated by the Lake County Stormwater Management Commission (SMC) and Lake County Emergency Management Agency (LCEMA).

Lake County, Illinois, is subject to natural hazards that threaten the life, health, and safety of residents and visitors. Natural hazards have caused extensive property damage throughout the County and can be expected to cause more damage in the future. In recent years:

- Major flood events struck the County in 1979, 1982, 1986, 1993, 1996, 2000, 2004, and 2008;
- Sixteen tornadoes have touched down since 1957;
- Severe thunderstorm, high winds, hail and rain impacted the County in 1996, 1998, 2002, 2007 and 2011
- Severe winter storms impacted the residents in 1999, 2000, 2008;
- Wildfires burned acreage in 2003 and 2005; and
- Extreme heat impacted the young and the elderly in 1999.

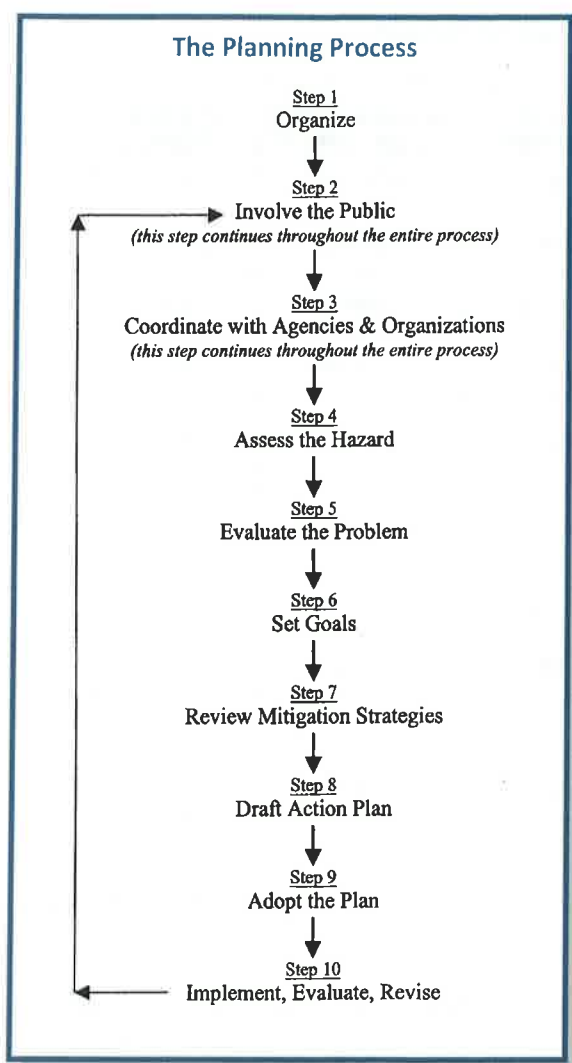
The update of the ANHMP was based on discussion and data provided by the participating municipalities as they followed the recommended 10-step planning process. An ANHMP introduction and a description of the planning process are presented in Chapters 1 and 2. Natural hazards that can impact Lake County have been assessed in Chapter 3. Goals and guidelines established by the HMPC are presented in Chapter 4. Six mitigation strategies and a capabilities assessment of Lake County are examined in Chapter 5. The ANHMP action plan is detailed in Chapter 6, and procedures for monitoring and maintaining this ANHMP are included in Chapter 7.

## **Chapter Summary**

**Introduction:** Lake County is the most northeastern County in Illinois. The County Seat is Waukegan, Illinois. The County is composed of 53 individual communities and 18 townships. The total area of Lake County is approximately 1,368 square miles with a land area of approximately 448 square miles and the rest water.

Land in the county generally slopes to the southeast. Lake County is approximately 23.5 miles from north to south. At its widest point, the southern county border, Lake County is approximately 22.6 miles from east to west. Elevations in the county range from 957 feet above sea level to 580 feet above sea level. There are four major watersheds in Lake County: Des Plaines River, Fox River, North Branch of the Chicago River, and Lake Michigan.

Lake County has a population of 703,462 and a population density of 1,572 people per square mile, according to the 2010 U.S. Census. Approximately 260,310 housing units exist within the County. Lake County is the third most populated county in Illinois behind Cook County and DuPage County. The Lake County population makes up approximately 5.5% of the total population in the State of Illinois.



**Planning Process:** The HMPC followed a 10-step planning process to update the ANHMP. The HMPC met three times from June to October 2016. The HMPC reviewed the hazards and their effects on people and property, considered a variety of ways to reduce and prevent damage, and recommended the most appropriate and feasible measures for implementation. Existing plans and programs were reviewed during the planning process. It should be underscored that this ANHMP does not replace other planning efforts, such as community comprehensive plans, or the Lake County Comprehensive Stormwater Management Plan. This ANHMP complements those efforts.

The public was invited to participate through several concurrent means, including the HMPC meetings, online surveys, paper surveys, press releases, newsletter articles, and the Lake County website. A public meeting was held on October 21, 2016 at the Lake County Administration Building in Waukegan, Illinois. The public comment period extended from October 21 to November 21, 2016.

**Natural Hazard Risk Assessment:** The HMPC reviewed all potential natural hazards that could impact Lake County, and evaluated them based on their causes, their likelihood of occurring, and their impact on people, property, critical facilities, and the local economy. The information was based on available technical studies and reports by the participating agencies and communities and on their past experiences. The table below shows the natural hazards that are the focus of this ANHMP and provides a summary of the hazards' potential impact on Lake County's health and safety, total assets, and economy from the risk assessment.

### Summary of Impact on Natural Hazards

Natural Hazard	Impact on Health and Safety	Impact on Buildings	Impact on Critical Facilities	Economic Impact
Floods	Moderate	High	Moderate	High
Tornado	High	High	Moderate	Moderate
Severe Summer Storms	Moderate	Moderate	Moderate	Low
Severe Winter Storms	Moderate	Moderate	Moderate	Low
Drought	High	Moderate	Low	Moderate
Earthquake	Low	Low	Moderate	Low
Dam Failure	--	--	--	--
Extreme Temperatures	High	Low	Low	Low
Erosion	--	--	--	--
Power Outage	Moderate	Low	High	Moderate

All exhibits included in Chapters 3 and 5 will be available on the SMC website. Exhibits can be downloaded at: [link to be updated]

**Hazard Mitigation Goals and Guidelines:** The goals of the ANHMP were reviewed and reaffirmed by the HMPC. The ANHMP goals are:

- Goal 1. Protect the lives, health, and safety of the people of Lake County from the impact and effects of natural hazards.
- Goal 2. Protect public services, utilities and critical facilities from potential damage from natural hazard events.
- Goal 3: Mitigate existing buildings to protect against damage from natural hazard events.
- Goal 4. Ensure that new developments do not create new exposures of people and property to damage from natural hazards.
- Goal 5. Mitigate to protect against economic and transportation losses due to natural hazards.

Chapter 4 presents guidelines developed by the HMPC for the purpose of achieving the above goals and to facilitate the development of hazard mitigation action items.

**Hazard Mitigation Strategies:** The HMPC then considered mitigation strategies for the natural hazards shown on page ES-4. The HMPC reviewed current preventive mitigation measures being implemented by the County and municipalities. Preventive measures include activities such as building codes and the enforcement of the Lake County Watershed Development Ordinance. Lake County is very strong in preventive measures through floodplain regulations and sustainable projects.

Property protection mitigation measures are used to modify buildings or property subject to existing damage. The HMPC agreed that special attention should be given to floodplain areas and designated repetitively flooded areas. SMC should continue with their voluntary floodplain acquisition program. Many measures can be implemented by the property owners, such as dry and wet floodproofing. Appropriate government activities include public information, technical assistance and financial support. Emphasis has also been placed on critical facilities; understanding their vulnerability to wind and severe storm hazards.

Natural resource protection activities are aimed at preserving (or in some cases restoring) natural areas. They include preserving wetlands, control of erosion and sedimentation, stream restoration, and urban forestry. Urban forestry programs are encouraged to protect utility lines during wind and ice storms.



Source: Daily Herald

The HMPC called for a better understanding of flood and other hazards to improve emergency management – preparedness, response and recovery.

Structural mitigation projects, such as the regional detention basins are still important within the County's comprehensive watershed management program. Additional watershed studies are still needed. The HMPC also recommended that each community establish a formal and regular program of drainage system maintenance and examine drainage improvements.

The HMPC identified numerous subject areas that would benefit from a coordinated public information program to focus on residents and property owners obtaining proper insurance and ways for people to protect themselves and their property from natural hazards.

**Mitigation Action Plan:** The action plan outlines the recommended activities and initiatives to be implemented over the next five years. It is understood that implementation is contingent on the availability of resources (staff and funding). The action plan identifies those responsible for implementing the action items, and when they are to be completed. Mitigation actions are not limited to those listed in the action plan. Other recommendations in this ANHMP (Chapter 5) should be implemented as opportunities arise.

There are [xx] action items included in this ANHMP update. The first two action items are administrative. The first action item calls for the formal adoption of this ANHMP. Formal adoption is a requirement for recognition of the ANHMP by mitigation funding programs. The HMPC will provide the mechanism and a vehicle for the ANHMP to be implemented, monitored, evaluated and updated, and for continued public involvement. The HMPC will report to the County Board and municipal councils and boards, annually, and participate in the next five year update.

The other action items are mitigation program items. Many are ongoing activities of stormwater management and emergency management offices and agencies. The action items were prioritized by the HMPC based on action that they felt should be implemented countywide and which each municipality should undertake. Community-specific action items are also presented in Chapter 6. A table summarizing the action items and the responsible agencies is presented on page ES-8.

**Case Study: Lake County's Flood Hazard Mitigation Program**

The Lake County Stormwater Management Commission began purchasing repetitively damaged homes and properties in 1998 utilizing funds from FEMA's Pre-Disaster Mitigation, Hazard Mitigation Grant, and Severe repetitive Loss Grant programs.

Grant funding received to date amounts to over \$9 million for the purchase of 198 structures and properties in the Village of Gurnee, the Village of Round Lake Heights, unincorporated Wauconda Township and other areas throughout the county. A mix of local cost-share funding has included Lake County's Capital Improvement Program, local municipalities and SMC.

## Plan Adoption

This ANHMP serves to recommend mitigation measures for Lake County. Adoption is also a requirement for recognition of the ANHMP by FEMA for mitigation funding programs.

The adoption of this *Lake County All Natural Hazards Mitigation Plan* will be done by resolution of the County Board, the city councils, and boards of trustees of each participating municipality. The municipal resolutions will adopt each action item that is pertinent to the community and a person responsible for it will be assigned. With adoption, the County and each municipality are individually eligible to apply for FEMA mitigation grant funding.

## Summary

This 2017 update to the ANHMP was developed by the Lake County HMPC as a multi-jurisdictional ANHMP to meet federal mitigation planning requirements. This ANHMP updated the examination of natural hazards facing Lake County, establishes mitigation goals, evaluates and highlights the existing mitigation activities underway in Lake County, and recommends a mitigation action plan for the County and municipalities to undertake in the next five years. The mitigation efforts included in this ANHMP are for the purpose of protecting people, property and other assets of Lake County. Some action items are ongoing efforts; others are new. Implementation of all action items is contingent on the availability of staff and funding.

This ANHMP will be adopted by resolution by the County and each participating municipality. This ANHMP will be implemented and maintained through both countywide and individual initiatives, as funding and resources become available.



**Table 6-1 Summary of 2017 ANHMP Hazard Mitigation Action Items**

Action Item:	Action Item To Be Implemented By:						
	Lake County Board	Lake County SMC	Lake County EMA	Lake County PB&D	Municipal Boards & Councils	Municipal Staff	Other Stakeholders
1. Plan Adoption	✓				✓		
2. Plan Monitoring and Maintenance		✓	✓			✓	
3. Incorporate ANHMP into Other County and Municipal Plans	✓	✓	✓	✓	✓	✓	✓
4. Continued Implementation of the WDO and NFIP Requirements		✓		✓		✓	
5. Improve Public Information - How Property Owners Can Protect Themselves		✓	✓	✓		✓	✓
6. Alternate Power Sources for Critical Facilities and Shelters			✓			✓	✓
7. Review and Mitigation of Critical Facilities		✓	✓			✓	✓
8. Improve Capacity of Drainage Systems		✓				✓	
9. Implement Maintenance Programs for Drainage Systems		✓				✓	
10. Property Protection Projects (Flooding Mitigation)		✓	✓			✓	✓
11. Reduce Inflow and Infiltration to Protect Against Sewer Backups						✓	
12. High-Wind Building Protection, Including Safe Rooms and Sheltering (Wind Mitigation)	✓	✓	✓	✓	✓		
13. Urban Forestry - Participation in Tree City USA						✓	
14. Continue Work for NIMS Compliance	✓		✓			✓	✓
15. Improve Building Codes and Building Code Enforcement				✓		✓	
16. Seek Mitigation Grant Funding for Additional Mitigation Planning and Cost Beneficial Projects		✓				✓	
17. Participation in StormReady			✓			✓	
18. Improve Emergency Response and Develop Assessment Teams		✓	✓			✓	
19. Improve Response & Recovery Information Sharing and Collaboration	✓		✓			✓	✓
20. Community Rating System Participation				✓		✓	
21. Continue to map natural hazard impacts and continue vulnerability assessments		✓	✓				
22. SMC Flood Mitigation Projects		✓				✓	
23. Development of Flood Stage Maps		✓				✓	

[This page intentionally left blank.]